

RGP-0045

REMARKS

Claims 1-34 are pending in the present application. Claims 21-31 and 33-34 have been withdrawn from consideration, claim 5 has been canceled, and claim 1 has been amended, leaving Claims 1-4, 6-22, and 32 for consideration upon entry of the present Amendment.

In particular, claim 1 has been amended to clarify that the term "thermoformable" has been intended to function as a claim limitation as of the filing of the application. This amendment therefore does not narrow the scope of the claim. Antecedent basis for this amendment may therefore be found in the claims as filed.

Claim 1 has also been amended to recite that the foams have a density of 10 to 40 pounds per cubic foot. Antecedent basis for this amendment is found at least on page 16, lines 7-8 of the specification as filed.

Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 102(e)

Claims 1-20 and 32 stand rejected under 35 U.S.C. § 102(e), as allegedly anticipated by Huygens et al. (U.S. 6,417,241). In particular, the Examiner states that "Applicants' claimed composition, recovery, and thermoformability degree values are held to be inherent" in Huygens. (Office Action, p. 3.)

Applicants respectfully traverse this rejection, on the basis that the properties set forth in Huygens show that the resilient foams disclosed therein are not the same as the thermoformable foams as presently claimed. First, Huygens discloses use of an isocyanate composition preferably having an absolute functionality of less than 2.15 (Col. 4, l. 54.) The present claims, in contrast, require an isocyanate composition having an average functionality of less than or equal to 2.14. In addition, the foams of Huygens are made using water (optionally with CO₂) as the sole blowing agent (col. 5, l. 37), together with low molecular weight amines (Table 1, showing the presence of DMAPA (dimethylaminopropylamine) and DMEA (dimethylethanolamine), and optionally TELA (triethanolamine) or DELA(diethanolamine)).

This results in compositions that react extremely fast upon mixing, thereby producing very low density foams, that is, foams having densities in the range of about 20-50 kg/m³ (1.25-

RGP-0045

3.12 pound/ft³) (col. 8, ll. 22-23; Table). These densities are significantly lower than the 10-40 pound/ft³ foams presently claimed. The compositions of Huygens further result in foams having very poor compression set values. Note in the Table at the last line that the compression set of the foams measured at minus 70°C are in the range of 3.6 to 7.9%. The present claims, in contrast, require a compression set at room temperature of less than 10%. Compression set is a measure of the amount by which a foam fails to return to its original shape after compression. As is known to those of ordinary skill in the art, compression set can increase rapidly with increasing temperature. The fact that the compression set of the Huygens foams was 3.6-7.9% at -70°C indicates that the compression set of the foams of at room temperature will be greater than 10%.

The compositions and foams of Huygens accordingly do not anticipate or render obvious the compositions and foams of the present invention, and reversal of the rejection and allowance of the claims is respectfully suggested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-20 and 32 further stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over GB 2,327,681 to Narayan ("GB '681"). In particular, the Examiner states that GB 2,327,681 differs from the present claims in that the functionalities of the isocyanate component disclosed therein are not specifically required to be below 2.15. The Examiner further states that

GB 2,327,681 does disclose low overall isocyanate functionalities and does demonstrate variability in functionality selection for the purpose of controlling physical properties. Accordingly, it would have been obvious for one having ordinary skill in the art to have lowered the overall isocyanate functionality of the isocyanate component of GB 2,327,681 as is provided for by GB 2,327,681 for the purpose of controlling physical properties of the prepared products in order to arrive at the products and/or processes of applicants' claims with the expectation of success in the absence of a showing of new or unexpected results.

(Office Action, pp. 4-5.)

Applicants respectfully traverse this rejection. GB '681 contains only the most general teaching that changing the functionality of the polyisocyanates disclosed therein results in changes in physical properties. Nothing in GB '681 suggests modifying the isocyanate functionality to lower than 2.43 (the lowest value in Table I), or that thermoformability, the

RGP-0045

claimed density, and excellent room temperature compression set resistance may be obtained by so doing. *Prima facie* obviousness requires that both the suggestion and the expectation of success must come from the cited art (or knowledge available to one of ordinary skill in the art). *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). GB '681 merely suggests that low viscosity and storage stability may be obtained by manipulation of the isocyanate functionality. There is nothing that indicates that a thermoformable polyurethane foam is obtainable.

The Examiner has further stated:

Applicants' claimed compression, recovery, and thermoformability degree values are maintained to be inherent to the various teachings of GB 2,327,681, owing to the similarities of the teachings involved. Applicants' have not demonstrated these values to have any distinction based on compositional differences not encompassed by the teachings of GB 2,327,681, and applicants have not, in fact, demonstrated them to be attributable to solely utilizing isocyanate functionalities of less than 2.15.

Applicants' allegation that the term "thermoformable" has a different meaning in GB 2,327,681 than it does in the instant claims not held to be evident as this term offers the claim no meaning in a patentable sense.

(Office Action, p. 5)

Applicants respectfully disagree, as the data in Tables 2-4 clearly show that thermoformability and other foam properties are dependent on the interplay between isocyanate functionality and other factors such as crosslinking in the soft segment. Nothing in GB '681 teaches or suggests that these factors may be modified to produce a foam with the claimed characteristics.

Applicants further wish to clarify a statement in their earlier response, in particular the statement that

While GB '681 is titled "Polymeric MDI composition for use in thermoformable foams", the described compositions are not thermoformable as that term is commonly understood.

(Response dated January 5, 2004.) By this, the Applicants did not mean that the term "thermoformable" as used GB '681 had a meaning different from the ordinary meaning. It was meant instead that the polymeric MDI's of GB '681 were not used to form thermoformable compositions per se. Note that in addition to the Title, the specification states that the compositions "are useful in thermoformable foams" at page 1, lines 7-9. Consideration of the

RGP-0045

specification as a whole shows that the phrase use/used "in thermoformable foams" refers to the fact that the disclosed polymeric MDI compositions are used physically in thermoformable foams, i.e., impregnated into a foam that is thermoformable. As is described at page 12, line 43 to page 13, line 8-47, the polymeric MDIs may be used as part of a hardener/binder composition. The MDIs are thus impregnated into a foam that upon contact with the reactive hydrogen-containing component is "inserted into a mold wherein the final product is formed at elevated temperatures." Clearly, it is the foam itself that is thermoformable, not the hardener/binder composition.

It is therefore believed that the term "thermoformable" in the present claims do provide patentable weight to the claims. "Thermoform" is term of art that means that a material can be shaped at elevated temperatures. When cooled, such articles maintain the shape imparted to them. (See p. 1 line 11 to page 2, line 4 of the instant specification). As is known to those of ordinary skill in the art, polyurethane foams are ordinarily not thermoformable. This limitation accordingly does add patentable weight to the claims.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By 

Leah M. Reimer

Registration No. 39,341

Date: July 26, 2004
Customer No.: 23,413
Telephone (860) 286-2929